

WHAT IS CLAIMED IS:

1. A fuel oil supply circuit for supplying fuel oil to a nozzle in an oil burner, comprising:

an oil pump connected to a fuel supply and adapted to provide pressurized fuel oil;
a regulating valve assembly having an inlet port receiving the pressurized fuel oil and an outlet port connected with the nozzle, the regulating valve assembly having open and closed positions allowing and preventing flow of the pressurized fuel oil between inlet and outlet ports, respectively;

a solenoid valve controlling flow of pressurized fuel oil through the regulating valve assembly, the solenoid valve having a first state keeping the regulating valve assembly closed and a second state allowing the regulating valve assembly to open; and

a diaphragm valve fluidically connected to the pump in parallel circuit with the regulating piston assembly, the diaphragm valve having a first position allowing flow of pressurized oil through a return to the fuel supply and a second position forcing oil to flow to the regulating valve assembly.

2. The fuel oil supply circuit of claim 1, further comprising a fuel supply passage between the oil pump and the regulating valve assembly further comprising a restricting valve interposed along the fuel supply passage dividing the fuel supply passage into upstream and downstream passages, the restricting valve adapted to provide a pressure drop from the upstream passage to the downstream passage.

3. The fuel oil supply circuit of claim 2 wherein the downstream passage includes a first branch to the regulating valve assembly and a second branch to the diaphragm valve, the upstream passage acting on the diaphragm valve opposite fluid pressure contained in the second branch, the diaphragm valve being spring biased to an open position in which the second branch is fluidically connected to the return leading to the fuel supply and closing in response to sufficient pressure in the upstream passage.

4. The fuel oil supply circuit of claim 3 wherein the regulating valve assembly comprises a piston and a spring, the spring acting on the piston tending to keep the regulating valve assembly closed, the regulating valve assembly adapted to open a passage leading to the nozzle via pressurized fuel oil acting upon a face of the piston against the action of the spring.

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5. The fuel oil supply circuit of claim 4 wherein the solenoid valve while in the first state bypasses fuel oil through the return to the fuel supply.

6. The fuel oil supply circuit of claim 1 wherein the solenoid valve includes a valve element that while in the first state blocks pressurized oil from flowing to through the outlet port and while in the second state opens the outlet port.

7. The fuel oil supply circuit of claim 1 wherein upon startup of the burner, the diaphragm valve closes to second position before the solenoid valve allows the regulating valve assembly to open.

8. The fuel oil supply circuit of claim 1 wherein the diaphragm valve closes when the pump reaches a predetermined speed, and wherein the solenoid valve allows the regulating valve assembly to open after a predetermined time, the regulating valve assembly staying closed until the pump reaches the predetermined speed and the predetermined time has elapsed.

9. The fuel oil supply circuit of claim 1 wherein the solenoid valve includes a thermistor providing delayed activation of the solenoid.

10. The fuel oil supply circuit of claim 1 wherein the solenoid valve is electronically controlled by a electronic controller of the burner.

11. A fuel oil supply circuit for supplying fuel oil to a nozzle in a oil burner, comprising:

an oil pump adapted to pressurize fuel oil;
an oil regulator regulating pressurized fuel oil from the oil pump to the nozzle;
an electrical control for the oil regulator, the electrical control adapted to prevent pressurized fuel flow to the nozzle upon startup of the burner and allow pressurized fuel flow to the nozzle after startup of the burner; and

a valve bypass in parallel circuit with the oil regulator responsive to oil pressure of the pressurized fuel oil, the bypass valve adapted to bypass oil past the oil regulator during the start up of the burner.

12. The fuel oil supply circuit of claim 11, further comprising a fuel supply passage between the oil pump and the regulator and a restricting valve interposed along the

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fuel supply passage dividing the fuel supply passage into upstream and downstream passages, the restricting valve adapted to provide a pressure drop from the upstream passage to the downstream passage, wherein the valve bypass is a diaphragm valve having one side subjected to the upstream passage and a second side subject to the downstream passage.

13. The fuel oil supply circuit of claim 11, wherein the diaphragm valve has an open position at startup in which fuel oil is recirculated to a fuel supply and a closed position preventing recirculation of fuel oil through the diaphragm valve, wherein the diaphragm valve includes a spring tending to keep the diaphragm valve open.

14. The fuel oil supply circuit of claim 11 wherein the electrical control is a solenoid valve.

15. The fuel oil supply circuit of claim 14 further comprising means for switching the solenoid valve between states after a predetermined time at startup of the burner.

16. The fuel oil supply circuit of claim 14 wherein the oil regulator comprises a piston and a spring, the spring acting on the piston tending to keep the oil regulator closed, the oil regulator adapted to open an outlet port leading to the nozzle via pressurized fuel oil acting upon a face of the piston against the action of the spring, the oil regulator having an excess fuel port recirculating fuel oil to a fuel oil supply for the pump, the piston adapted to open the excess fuel port when excess fuel oil is supplied to the oil regulator.

17. The fuel oil supply circuit of claim 16 wherein the solenoid valve controls fuel oil flow through a bypass port in the oil regulator, the bypass port recirculating fuel oil to the fuel oil supply for the pump, sufficient fuel oil flowing through the bypass port to relieve pressure in the oil regulator and keep the piston closed over the outlet port.

18. The fuel oil supply circuit of claim 16 wherein the solenoid valve blocks flow through a second outlet port between said first outlet port and the nozzle during startup of the burner, and intermediate passage connecting the first and second outlet ports.

19. The fuel oil supply circuit of claim 11 wherein the valve bypass closes when the pump reaches a predetermined speed, and wherein the electrical control allows the regulating valve assembly to open after a predetermined time, the oil regulator staying closed until the pump reaches the predetermined speed and the predetermined time has elapsed.

20. The fuel oil supply circuit of claim 11 wherein the electrical control and the valve bypass each independently prevent smoking and soot production in the combustion chamber of the burner upon startup of the burner.

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